PROCEEDINGS

OF THE

MADRAS GOVERNMENT

IN THE

PUBLIC WORKS DEPARTMENT.

IRRIGATION BRANCH,

FOR THE

MONTH OF JUNE 1892.

Printed by Authority.

MADRAS:
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.

1892.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

Note by the Chief Engineer for Irrigation.

No. 101 I.

The accompanying two statements which compare the expenditure incurred on "Irrigation," "Navigation" and "Agricultural" works during 1891–92 with the final grants for the year are, in accordance with G.O. No. 141 W., dated 13th January 1883, submitted to Government.

2. The figures of expenditure, which have been checked by the Examiner of Public Works Accounts, are not final, as the annual accounts have not yet been closed. Last year, in the review similar to this, there was an apparent lapse of 5·1 per cent., but, when the final accounts were made up, this, as anticipated, was much reduced and was shown to be only 1·6 per cent.

The total expenditure in the year now under review was under all heads Rs. 73,81,006, which is considerably greater than in any previous year and is Rs. 1,04,006 in excess of the grants. Of this excess Rs. 46,485 occurred under "49, Capital expenditure not charged to Revenue" in No. I Periyár division, where advantage was taken of a favorable season to push on with the works, and Rs. 56,711 occurred under "Provincial 43. Minor Works, and Navigation" on account of the necessity for carrying on several works for relief purposes which would not otherwise have been commenced.

3. Besides the expenditure above dealt with, Rs. 54,513 of the total outlay charged to the suspense head "Famine" remained unadjusted, the normal value of work done not having yet been ascertained.

4. 35. *Protective Works— Irrigation.*—The excess expenditure under this head amounted to 0·56 per cent. on the final grant and is due to the grant for tools and plant required for the Rushikulya project having been found insufficient to meet requirements. The expenditure on the Rushikulya project on "*Works*" was Rs. 5,16,620 (grant Rs. 5,16,722), a most excellent outturn and achieved by a comparatively small staff.

5. 42. *Major Works (Working expenses).*—The total lapse under this head amounted to only 0·13 per cent. of the grant for the Kurnool-Cuddapah canal under "Extensions and improvements;" there was a lapse of Rs. 1,041, which was, it is stated, reserved for expenditure in flooding dry cultivation on account of drought, which, however, was not found necessary. There also appears a lapse of grant for this canal of Rs. 3,033 under "Maintenance and repairs," but the annual payment of Rs. 3,400 to the Telegraph department for supervision and maintenance of the telegraph line on the canal has yet to be adjusted in the supplemental accounts. In the Negapatam division there appears a lapse of Rs. 1,927 under "Extensions and improvements," but the value, viz., Rs. 2,000, of shutters supplied by the Public

Works Workshops, Madras, for the Vadugacheruvu dam has to be adjusted in the supplemental accounts. In the same division there was a lapse under "Maintenance and repairs" of Rs. 1,333 which it is said was due to changes in the establishment of this division.

6. 49. *Capital expenditure not charged to Revenue.*—There was an excess expenditure under this head of 2·93 per cent, the chief cause of which has been explained in para. 2. But though there was a total excess under this head, there was a *short* expenditure of Rs. 2,708 on the Godávari delta system due, it is said, to non-payment by the Revenue Department of compensation for land; and in the Nellore division, under the Pennér and Sangam anicut systems, the expenditure fell short of the grant by Rs. 5,892, owing chiefly to non-submission in proper time by the Executive Engineer of estimates for minor channels of the Sangam anicut system.

7. *Provincial*—43. *Minor Works and Navigation.*—The total excess expenditure on all classes of works under this head was Rs. 56,711. Of this Rs. 21,394 occurred on minor works under the charge of the Public Works Department and the remainder on those under the charge of the Revenue department; the main causes of the excess are stated in para. 2, and there seems no necessity to here deal with the small variations between grants and expenditure which occurred under the various classes of works under this head.

8. *General Remarks.*—The ratio of total expenditure to total allotment under all heads is excellent in most of the divisions and fair in all the others excepting in Nellore, Kurnool and Negapatam, in which, allowing for the adjustments which it is known will have to be made in the final accounts (see para. 5), there are lapses of 5·04, 8·9 and 2·88 per cent. respectively.

CHEPÂK,
1st June 1892.

(Signed) G. T. WALCH,
Chief Engineer for Irrigation.

To the Joint Secretary to Government,
Public Works Department, Irrigation Branch.

Enclosures.

A.—Statement showing by divisions the grants for and expenditure incurred on Original Works and Repairs under Irrigation, Navigation and Agricultural Works during 1891–92.

Divisions.	Imperial.								Provincial 43. Minor Works and Navigation.					
	35. Protective works, Irrigation.		42. Major Works—Working expenses.				49. Capital expenditure not charged to Revenue.		Irrigation and Navigation works for which Capital and Revenue Accounts are kept.					
			Extensions and improvements.		Maintenance and repairs.				Capital account.		Revenue account.			
											Extensions and improvements.		Maintenance and repairs.	
	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1. Rushikulya ..	5,16,722	5,16,620	..	..	..	..	..	..	..	..	..	..	..	..
2. Ganjam ..	..	..	..	..	..	..	..	..	5,500	5,633	..	..	4,686	4,691
3. Vizagapatam ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4. Godávari, Eastern ..	..	..	13,349	13,896	84,500	85,568	41,400	40,803	..	..	..	..	..	..
5. Do. Western ..	..	..	19,896	21,156	1,58,034	1,55,799	6,472	4,361	..	..	..	..	..	..
6. Kistna, Eastern ..	..	..	7,000	7,122	84,560	86,133	70,242	64,008	..	..	..	..	..	..
7. Gudiváda ..	..	..	4,750	4,670	38,000	38,062	78,000	80,051	..	..	..	..	..	..
8. Kistna, Western ..	..	..	2,000	2,548	81,289	83,961	1,81,792	1,85,264	..	..	..	..	..	..
9. Nellore ..	..	..	19,127	18,712	57,000	55,058	21,830	15,938	..	..	..	..	..	..
10. Buckingham canal ..	..	..	..	..	..	..	..	..	2,05,392	2,05,297	5,000	5,069	1,20,950	1,21,098
11. Cuddapah ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12. Kurnool ..	..	..	10,700	9,659	79,300	76,267	..	..	..	..	..	195	8,390	2,296
13. Anantapur ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14. Bellary ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15. West Coast ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16. Coimbatore ..	..	..	..	..	..	..	..	..	3,190	2,086	4,292	4,363	17,832	16,091
17. Salem district ..	..	..	264	264	1,816	1,816	1,354	1,354	..	..	..	..	..	.
18. Salem division ..	..	..	1,362	1,576	1,046	1,884	3,711	1,526	..	..	..	..	..	..
19. North Arcot ...	..	..	..	..	..	..	..	..	26,358	26,370	76,646	75,993	78,698	79,502
20. Chingleput ..	..	..	..	..	..	..	..	..	..	..	1,342	1,384	36,314	36,412
21. South Arcot ..	..	..	..	..	..	..	..	..	13,335	13,448	14,125	15,038	70,079	69,901
22. Tanjore ..	..	..	23,588	22,641	36,139	36,369	..	..	..	..	34	35	5,000	4,904
23. Negapatam ..	..	..	10,594	8,667	24,000	22,667	..	..	..	..	..	..	4,193	2,803
24. Trichinopoly ..	..	..	340	334	12,350	12,408	..	..	..	..	..	..	..	..
25. Madura ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26. Tinnevelly ..	..	..	6,383	5,698	11,118	10,634	..	..	..	..	600	599	9,057	7,661
27. No. 1 Periyár ..	..	..	..	..	..	..	4,73,250	5,19,735	..	..	..	..	..	..
28. ,, 2 do. ..	..	..	..	..	..	..	2,30,576	2,78,588	..	..	..	..	..	..
29. Tank Restoration Central office ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30. Adjustment of old maintenance charges.	..	..	− 4,261	− 4,261	−1,36,586	−1,36,586	..	..	..	..	− 6,120	− 6,120	− 6,264	− 6,264
Total ..	5,16,722	5,16,620	1,15,092	1,12,682	5,32,566	5,30,040	11,58,627	11,91,628	2,53,775	2,52,834	95,919	96,556	3,48,935	3,39,095
31. Revenue Department.	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

A.—Statement showing by divisions the grants for and expenditure incurred on Original Works and Repairs, &c.—*cont.*

Divisions.	PROVINCIAL, 43. MINOR WORKS AND NAVIGATION—*cont.*													
	Irrigation and Navigation works for which Capital and Revenue Accounts are not kept, P.W.D.				Tank Restoration Works.						Minor Works, Revenue Department.			
	Original Works.		Repairs.		Survey establishment.		Original Works.		Repairs.		Original Works.		Repairs.	
	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.
	16	17	18	19	20	21	22	23	24	25	26	27	28	29
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1. Rushikulya	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2. Ganjam	7,690	7,697	16,943	17,442	..	..	..	..	..	..	..	..	..	..
3. Vizagapatam ..	14,033	13,762	6,000	599,3	2,472	2,045	3,000	2,993	5,000	5,005	..	..	..	..
4. Godávari, Eastern ..	6,500	6,651	17,171	17,200	..	..	6,500	6,625	4,500	4,539	..	..	..	..
5. Do. Western ..	1,500	1,289	3,900	3,824	..	..	4,600	5,272	8,000	7,730	..	..	..	..
6. Kistna, Eastern ..	4,000	3,573	7,000	7,516	..	..	..	..	..	..	..	..	..	..
7. Gudiváda	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8. Kistna, Western ..	..	..	..	..	3,431	3,592	1,200	1,023	1,500	1,500	..	..	..	..
9. Nellore	53,750	52,688	18,906	18,061	..	..	..	..	..	..	..	..	..	..
10. Buckingham canal ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11. Cuddapah	22,000	22,405	30,000	30,144	..	..	..	..	1,500	1,288	..	..	..	..
12. Kurnool	2,200	385	14,600	12,285	..	..	8,000	6,129	7,800	8,752	..	..	..	..
13. Anantapur	9,150	10,832	5,310	4,710	..	..	1,716	2,174	62	4	..	..	..	..
14. Bellary	45,252	46,147	24,690	27,412	..	..	4,711	4,742	3,938	3,344	..	..	514	560
15. West Coast	..	— 645	1,200	1,779	..	..	..	..	..	..	..	..	..	..
16. Coimbatore	12,847	12,861	22,294	24,050	..	..	15,777	16,172	12,000	12,161	..	..	..	..
17. Salem district ..	2,953	2,953	5,666	5,666	1,785	1,785	8,128	8,128	19,950	19,950	..	..	..	..
18. Do. division ..	6,463	6,863	5,334	6,081	1,839	1,101	4,872	5,348	10,050	10,519	880	..	..	..
19. North Arcot ..	14,567	17,058	28,950	46,887	3,778	2,886	25,000	28,830	60,000	63,830	820	2,217	1,180	2,172
20. Chingleput	39,144	39,616	1,16,000	1,16,271	..	2,759	40,000	37,408	56,200	56,542	..	..	..	..
21. South Arcot ..	44,154	45,394	64,000	65,570	326	326	8,000	8,468	41,344	41,483	..	..	1,095	..
22. Tanjore	1,000	1,019	..	..	..	..	..	..	..	..	..	..	..	..
23. Negapatam	1,971	2,008	3,000	3,219	..	..	..	..	..	..	..	..	..	..
24. Trichinopoly ..	30,680	29,406	22,503	22,023	..	..	..	..	..	..	..	..	..	..
25. Madura	16,800	17,110	14,900	15,379	2,504	2,639	34,431	34,511	43,000	43,053	..	..	..	..
26. Tinnevelly	17,248	20,125	45,028	42,144	2,500	2,495	11,487	11,554	25,825	26,550	..	..	2,560	2,904
27. No. 1 Periyár ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28. ,, 2 do. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29. Tank Restoration Central office	..	..	..	..	2,188	1,212	..	..	..	..	..	..	..	..
30. Adjustment of old maintenance charges.	10,381	10,381	1,42,850	1,42,850	..	..	..	..	..	..	..	..	..	..
Total ..	3,64,283	3,69,578	6,16,242	6,36,506	20,823	20,840	1,77,422	1,79,377	3,00,669	3,06,250	1,700	2,217	5,349	5,636
31. Revenue Department.	..	..	..	..	..	..	..	..	..	..	..	..	5,00,000	5,35,317
Total ..	..	..	..	..	..	..	..	..	..	..	..	..	5,05,349	5,40,953

A.—Statement showing by divisions the grants for and expenditure incurred on Original Works and Repairs, &c.—*cont.*

Divisions.	Provincial, 43. Minor Works and Navigation—*cont.* Kistna Upland Project. Grant.	Provincial, Kistna Upland Project. Outlay.	Agricultural Works. Original Works. Grant.	Agricultural Works. Original Works. Outlay.	Agricultural Works. Repairs. Grant.	Agricultural Works. Repairs. Outlay.	Local Irrigation Cess Fund, 43. Minor Works and Navigation. Original Works. Grant.	Local Irrigation Cess Fund. Original Works. Outlay.	Local Irrigation Cess Fund. Repairs. Grant.	Local Irrigation Cess Fund. Repairs. Outlay.	Total. Grant.	Total. Outlay.	Famine Relief works, outlay.
	30	31	32	33	34	35	36	37	38	39	40	41	42
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1. Rushikulya ..	..	..	..	..	3,050	3,050	..	..	..	..	5,19,772	5,19,670	..
2. Ganjam ..	..	..	..	..	8,057	8,072	..	..	..	..	42,876	43,535	..
3. Vizagapatam ..	..	..	500	498	3,500	3,497	..	..	..	..	34,505	33,793	..
4. Godávari, Eastern ..	..	..	13,500	12,985	26,000	26,399	..	..	..	..	2,13,420	2,14,666	..
5. Do. Western ..	..	..	5,993	6,192	40,330	40,673	..	..	..	..	2,48,725	2,46,296	..
6. Kistna, Eastern ..	..	..	622	379	14,147	14,571	..	..	..	..	1,87,571	1,83,302	..
7. Gudiváda ..	..	..	..	..	..	..	..	..	..	..	1,20,750	1,22,783	..
8. Kistna, Western ..	3,726	3,878	..	..	13,000	12,813	..	..	..	..	2,87,938	2,94,579	..
9. Nellore ..	..	..	3,100	2,487	8,750	10,322	..	..	..	..	1,82,463	1,73,266	..
10. Buckingham canal ..	..	..	10,000	9,909	..	..	..	..	..	..	3,41,342	3,41,373	..
11. Cuddapah ..	..	..	553	89	7,700	7,758	..	..	..	..	61,753	61,684	53
12. Kurnool ..	..	..	..	..	..	..	..	..	..	..	1,30,990	1,15,968	434
13. Anantapur ..	..	..	..	..	..	..	..	..	..	..	16,238	17,720	118
14. Bellary ..	..	..	..	..	..	..	16,000	16,068	..	..	95,105	98,273	1,680
15. West Coast ..	..	..	..	..	..	..	..	..	..	..	1,200	1,134	..
16. Coimbatore ..	..	..	1,750	2,268	2,770	2,763	2,000	2,096	..	..	94,752	94,911	..
17. Salem district ..	..	..	41	41	360	360	..	871	1,732	861	44,049	44,049	..
18. Do. division ..	..	..	159	149	270	259	..	791	3,268	2,407	39,254	38,504	..
19. North Arcot ..	..	..	500	510	5,800	4,920	..	..	..	..	3,22,297	3,51,175	52,228
20. Chingleput ..	..	..	8,410	8,510	10,300	10,433	..	..	..	..	3,07,710	3,09,335	..
21. South Arcot ..	..	..	5,663	5,920	10,000	10,116	..	..	..	..	2,72,121	2,75,664	..
22. Tanjore ..	..	..	7,118	4,573	50,948	50,917	..	..	..	..	1,23,827	1,20,458	..
23. Negapatam ..	..	..	5,961	5,818	26,000	26,353	..	..	..	..	75,719	71,535	..
24. Trichinopoly ..	..	..	26,395	26,012	30,399	30,446	..	..	..	..	1,22,664	1,20,629	..
25. Madura ..	..	..	..	..	..	..	..	..	..	..	1,11,635	1,12,692	..
26. Tinnevelly ..	..	..	7,400	7,279	3,100	3,081	..	..	..	..	1,42,306	1,40,724	..
27. No. 1 Periyár ..	..	..	..	..	..	..	..	..	..	..	4,73,250	5,19,735	..
28. ,, 2 do. ..	..	..	..	..	..	..	..	..	..	..	2,80,576	2,78,588	..
29. Tank Restoration Central office ..	..	..	..	..	..	..	..	..	..	..	2,188	1,212	..
30. Adjustment of old maintenance charges.	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	3,726	3,878	97,665	93,619	2,64,481	2,66,803	18,000	19,826	5,000	3,268	48,96,996	49,47,253	54,513
31. Revenue Department.	..	..	..	..	..	..	..	..	..	..	5,00,000	5,35,317	..
Total ..	..	..	..	..	..	..	..	..	..	..	53,96,996	54,82,570	..

B.—STATEMENT showing by systems the grants for and expenditure incurred on Irrigation, Navigation and Agricultural Works during 1891-92.

—	Revised estimate for 1891-92.					Expenditure incurred in 1891-92.						
	Original works.	Repairs.	Establishment.	Tools and plant.	Total.	Original works.	Repairs.	Establishment.	Tools and plant.	Refunds of revenue.	Less receipts on capital expenditure.	Total.
IMPERIAL.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
35. CONSTRUCTION OF PROTECTIVE IRRIGATION WORKS.												
Rushikulya project	5,16,722	..	1,18,501	4,777	6,40,000	5,16,620	..	1,17,801	9,916	..	766	6,43,571
42. MAJOR WORKS.												
Working Expenses.												
Godávari delta system	33,245	2,42,534	1,92,684	39,216	5,07,679	35,052	2,41,367	1,97,021	38,239	279	..	5,11,958
Kistna do.	13,750	2,03,849	1,50,628	40,721	4,08,948	14,340	2,08,156	1,46,561	38,537	327	..	4,07,921
Pennér anicut	1,563	13,140	11,122	— 5	25,820	2,094	12,861	11,436	— 5	2	..	26,388
Sangam do.	13,655	18,116	16,147	— 7	47,911	12,709	16,453	16,441	— 37	..	..	45,566
Kurnool-Cuddapah canal	10,700	79,300	26,458	3,182	1,19,640	9,659	76,267	24,679	3,264	240	..	1,14,109
Barúr tank	1,626	2,862	1,512	..	6,000	1,840	3,700	1,754	..	..	..	7,294
Cauvery delta system	34,522	— 33,145	37,299	— 653	38,023	31,642	— 34,190	43,017	— 804	8	..	39,673
Srívaikuntham anicut system	6,031	5,910	8,116	— 78	19,979	5,346	5,426	8,843	— 78	..	..	19,537
Total ..	1,15,092	5,32,566	4,43,966	82,376	11,74,000	1,12,682	5,30,040	4,49,752	79,116	856	..	11,72,446
49. CAPITAL EXPENDITURE NOT CHARGED TO REVENUE.												
Godávari delta system	47,872	..	9,951	9,100	66,923	45,164	..	9,836	9,277	..	20	64,257
Kistna do.	3,30,034	..	71,538	19,322	4,20,894	3,29,323	..	72,828	18,371	..	— 125	4,20,647
Cauvery do.	..	..	..	..	..	..	..	..	..	..	3	— 3
Pennér anicut	1,230	..	283	..	1,513	505	..	116	..	..	..	621
Sangam do.	20,600	..	3,726	..	24,326	15,433	..	2,918	— 3,123	..	..	15,228
Barúr tank	5,065	..	1,166	..	6,231	2,880	..	620	..	..	..	3,500
Periyár project	7,53,826	..	1,71,569	94,718	10,20,113	7,98,323	..	1,82,047	1,03,554	..	2,409	10,81,515
Kurnool-Cuddapah canal	..	..	..	..	..	..	..	..	..	..	581	— 581
Total ..	11,58,627	..	2,58,233	1,23,140	15,40,000	11,91,628	..	2,68,365	1,28,079	..	2,888	15,85,184
Total, Imperial ..	17,90,441	5,32,566	8,20,700	2,10,293	33,54,000	18,20,930	5,30,040	8,35,918	2,17,111	856	3,654	34,01,201
PROVINCIAL.												
43. IRRIGATION AND NAVIGATION.												
Works for which Capital and Revenue Accounts are kept.												
Capital Account.												
Pálár anicut	26,358	..	6,062	65	32,485	26,370	..	5,958	..	..	..	32,328
Pelandorai	835	..	..	..	835	835	..	36	..	..	..	871

Arkenkotta channel	3,190	..	734	..	3,924	2,086	..	480	..	..	..	2,566
Tirukoilúr anicut	10,000	..	2,300	..	12,300	10,315	..	2,371	..	..	..	12,686
Satiatope do.	2,500	..	575	..	3,075	2,298	..	528	..	..	..	2,826
Buckingham canal	2,05,392	..	47,241	600	2,53,233	2,05,297	..	45,997	288	..	59	2,51,523
Ganjam-Gopálpur canal	5,500	..	..	..	5,500	5,633	..	..	..	..	..	5,633
Total ..	2,53,775	..	56,912	665	3,11,352	2,52,834	..	55,370	288	..	59	3,08,433
Revenue Account.												
Cumbum tank system	..	8,390	1,930	..	10,320	195	2,296	573	642	..	..	3,706
Thadapalle channel	4,060	4,984	2,080	..	11,124	3,859	4,153	1,866	..	..	..	9,878
Arkenkotta do.	17	1,798	417	..	2,232	17	1,146	267	..	..	..	1,430
Kalingaroyen do.	215	11,050	2,590	..	13,855	487	10,792	2,594	..	..	..	13,873
Poiney Anicut	3,317	8,000	2,613	..	13,930	3,535	8,207	2,774	..	..	..	14,516
Cheyár do.	56,750	22,698	18,283	..	97,731	56,811	22,884	18,388	..	..	..	98,083
Pálár do.	17,077	55,191	16,747	— 4	89,011	16,154	55,592	16,609	— 4	..	..	88,351
Chembrambaukam tank	— 2,207	9,399	1,661	— 109	8,744	— 2,189	9,405	1,661	— 109	..	..	8,768
Madras Water-supply	— 3,010	12,794	3,470	— 10	13,244	— 2,995	12,902	3,343	— 10	..	..	13,240
Vallur anicut	..	724	167	..	891	..	718	165	..	..	..	883
Pelandorai anicut	3,082	9,742	2,954	— 2	15,776	3,512	9,688	3,047	— 2	..	..	16,245
Shatiatope do.	1,553	14,575	3,785	..	19,913	1,647	14,898	3,824	..	..	..	20,369
Vriddháchalam anicut	2,500	5,252	1,784	..	9,536	2,840	5,331	1,879	..	..	..	10,050
Mehamatúr do.	..	12,480	2,870	..	15,350	..	12,433	2,861	..	..	..	15,294
Tirukoilúr do.	4,865	14,972	4,618	..	24,455	4,903	15,220	4,610	..	..	..	24,733
Lower Coleroon do.	2,100	18,000	4,726	..	24,826	2,112	17,178	4,467	..	..	..	23,757
Marudur do.	600	9,057	2,281	..	11,938	599	7,661	2,007	..	30	..	10,297
Chilka lake canal	..	4,686	1,078	..	5,764	..	4,630	1,051	..	..	..	5,681
Buckingham canal	5,000	1,20,950	38,468	1,981	1,66,399	5,069	1,21,098	38,851	1,817	57	..	1,66,892
Vedarniem canal	..	4,193	1,045	..	5,238	..	2,803	769	..	..	..	3,572
Ganjam-Gopálpur canal	..	..	..	..	..	..	60	14	..	..	..	74
Total ..	95,919	3,48,935	1,13,567	1,856	5,60,277	96,566	3,39,095	1,11,620	2,334	87	..	5,49,692
IRRIGATION AND NAVIGATION.												
Works for which neither Capital nor Revenue Accounts are kept.												
Old maintenance charges	10,381	1,42,850	2,09,070	1,868	3,64,169	10,381	1,42,850	2,09,070	1,868	..	..	3,64,169
Ordinary works, P.W.D.	3,53,902	4,73,392	1,91,208	12,409	10,30,911	3,59,197	4,93,656	1,96,137	12,712	..	..	10,61,702
Minor Works, Revenue Department ..	1,700	5,05,349	1,601	103	5,08,753	2,217	5,40,953	1,806	118	..	..	5,45,094
Tank Restoration Investigation	20,823	..	49,657	1,067	71,547	20,840	..	52,347	— 4,483	..	..	68,704
Execution	1,77,422	3,00,669	1,09,960	7,170	6,95,221	1,79,377	3,06,250	1,11,694	7,284	..	..	6,04,605
Investigation of upland project	3,726	..	751	600	5,077	3,878	..	749	610	..	..	5,237
Total ..	5,67,954	14,22,260	5,62,247	23,217	25,75,678	5,75,890	14,83,709	5,71,803	18,109	..	..	26,49,511
Agricultural works	97,665	2,64,481	85,114	5,433	4,52,693	93,619	2,66,803	83,828	4,566	259	..	4,49,075
Total Provincial ..	10,15,313	20,35,676	8,17,840	31,171	39,00,000	10,18,899	20,89,607	8,22,621	25,297	346	59	39,56,711

B.—Statement showing by systems the grants for an expenditure incurred on Irrigation, Navigation and Agricultural Works during 1891-92—*cont.*

—	Revised estimate for 1891-92.					Expenditure incurred in 1891-92.						
	Original works.	Repairs.	Establishment.	Tools and plant.	Total.	Original works.	Repairs.	Establishment.	Tools and plant.	Refund of revenue.	Less receipts on Capital Account.	Total.
LOCAL.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
43. MINOR WORKS AND NAVIGATION.												
Works for which Capital and Revenue Accounts are kept.												
Revenue Account.												
Thadapalle channel	2,000	..	..	..	2,000	2,096	..	..	..	..	..	2,096
Works for which neither Capital nor Revenue Accounts are kept	16,000	5,000	..	..	21,000	17,730	3,268	..	..	..	..	20,998
Total ..	18,000	5,000	..	..	23,000	19,826	3,268	..	..	..	..	23,094
Grand Total ..	28,23,754	25,73,242	16,38,540	2,41,464	72,77,000	28,59,655	26,22,915	16,58,539	2,42,408	1,202	3,713	73,81,006

ORDER—dated 8th June 1892, No. 520 I., Public Works.

The Governor in Council has received with much pleasure the foregoing report on the utilisation of the irrigation grants for 1891–92 which were exceptionally large. The results achieved may be said to be excellent all round and reflect credit on all concerned. The shortfalls in three divisions noticed by the Chief Engineer are in themselves of small amount and will be further reduced when the accounts are closed. The energy with which the works on the Rushikulya and Periyár Projects have been pushed on is especially gratifying. His Excellency in Council congratulates Mr. Walch and the department on the operations of the year.

(True Extract.)

(Signed) G. T. WALCH,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the Chief Engineer, Public Works Department.
,, the Chief Engineer for Irrigation.
,, Superintending Engineers.
,, the Superintendent of Works, No. I Periyár Division.
,, the Revenue Department.
,, the Examiner, Public Works Accounts.

1

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated June, 8th.

Recd. *Encl.*

G.O., 8th June 1892, No. 520 I.

JUNE

Expenditure on Irrigation, Navigation and Agricultural Works

Orders on the statements comparing the —incurred during 1891-92 with the grants for the year.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper:—

From Lieut.-Colonel A. C. SMITH, R.E., Superintending Engineer, VI Circle, to the Chief Engineer, Public Works Department, dated Trichinopoly, 21st May 1892, No. 80 P.R.

I have the honour to forward, for your approval and sanction of Government, an estimate, amounting to Rs. 3,400, together with plan, for constructing a bridge near Velichinatham at 23 mile 1 furlong 642 feet on the 6th Reach of the Main channel of the Periyár project.

2. The estimate has been prepared at the request of the Collector who considers that a bridge at the spot where the channel crosses the cart-track leading to Alagarcovil is necessary for the convenience of the villagers who are obliged to go to their fields on the north of the channel. These fields are within a few yards or within a furlong by the bridge at Vaidamaruthur which is a mile and a quarter, or by the superpassage across jungle stream called Kukkal odai which is about a mile from Velichinatham. It is therefore considered very hard to compel the ryots to walk such a long distance every day. The channel, moreover, cuts off all communication between this and several other villages on the north, of which Palamedu, where a weekly market is held, is very important. The Collector and Deputy Collector therefore strongly recommend the construction of the bridge.

3. By building a bridge near Velichinatham, it could, if found necessary, hereafter be converted into a regulator, for it is in just the proper position below Vedakulam tank. The drainage is very insignificant and may be disposed of by a catch drain. The site proposed therefore appears suitable.

4. The bridge is to consist of 3 arches of 18 feet span, rise $3\frac{1}{2}$ feet and piers 6 feet in height. The roadway between parapets is to be 9 feet.

5. The work is not included in the estimate for the project, and the cost therefore is to be met from the provision for unforeseen works.

ENCLOSURE.

REPORT to accompany plan and estimate for constructing a bridge near Velichinatham at 23 mile 1 furlong and 642 feet, 6th Reach, Main channel.

	RS.
Amount of estimate	3,400

This estimate is prepared on the request of the Collector of Madura—*vide* his letter to the Superintending Engineer, No. 372, dated 19th February 1891, and its enclosures.

The work is not included in the estimate for the project and the cost therefore is to be met with from the provision for unforeseen works.

MADURA,
20th April 1892.

(Signed) G. P. CARLESS,
Executive Engineer, No. II Periyár Division.

ORDER—dated 11th June 1892, No. 526 I., Public Works.

The following estimate is sanctioned from the balance of the amount reserved for unforeseen works of the Periyár project, which will then be reduced to Rupees 2,14,771:—

Capital expenditure not charged to Revenue.
49. Irrigation.
Periyár Project.
I. Works.
(2) Main Canals and Branches.
Main Channel, 6th Reach.
G. Bridges.

	RS.
Constructing a bridge near Velichinatham at 23 mile 1 furlong 642 feet, estimate	3,400

2. This sanction is registered as No. 48 I. of 1892–93.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintending Engineer, VI Circle, with five enclosures.
,, Chief Engineer for Irrigation.
,, Examiner, Public Works Accounts.
,, Revenue Department.
Editors' Table.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.
PUBLIC WORKS.

Dated June, 11th.

Recd. *Encl.*

G.O., 11th June 1892, No. 526 I.

JUNE.

Periyar Project

Bridge.—Estimate of Rs. 3,400 for constructing a — near Velichinatham at 23 mile 1 furlong 642 feet on the 6th Reach of the Main channel, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From the Executive Engineer, No. II Periyár division, to the Superintending Engineer, VI Circle, dated 24th May 1892, No. 932.

According to the instructions conveyed in the Chief Engineer's memorandum No. 2267 C., dated 28th April 1892, I have the honour to submit for sanction plan and estimate for a weir 200 feet in length to be built at the west end of Vedakulam tank at a cost of Rs. 4,580.

2. On your next inspection the necessity or otherwise of a subsidiary weir in the channel itself can be decided. But I beg, however, to solicit early sanction to commence this work so that it may be completed before the heavy rains.

3. The cost will be provided for in the revised appropriation statement.

No. 102 P.R.

Copy, together with the plan and estimate, is submitted to the Chief Engineer, Public Works Department, for his approval and early sanction of Government with reference to his memorandum quoted by the Executive Engineer.

4th June 1892.

(Signed) A. C. SMITH, Lieut.-Col., R.E.,
Suptg. Engineer, VI Circle.

ORDER—dated 13th June 1892, No. 530 I., Public Works.

The following estimate, amounting to Rs. 4,580, is sanctioned from the balance of the amount reserved for unforeseen works of the Periyár Project, which will then be reduced to Rs. 2,10,191 :—

Capital expenditure not charged to Revenue.
49. Irrigation.
Periyár Project.
I. Works.
(2) Main Canals and Branches.
Main Channel, 6th Reach.
E. Falls and Weirs.

	RS.
Constructing a weir at the west end of Vedakulam tank, estimate ...	4,580

2. This sanction is registered as No. 51 I. of 1892–93.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintending Engineer, VI Circle, with three enclosures.
„ Chief Engineer for Irrigation.
„ Examiner, Public Works Accounts.
„ Revenue Department.
Editors' Table.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated June, 13th.

Recd. *Encl.*

G.O., 13th June 1892, No. 530 I.

JUNE.

Periyar Project

Weir.—Estimate of Rs. 4,580 for constructing a — at the west end of Vedakulam tank, 6th Reach, Main channel, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

From G. P. CARLESS, Esq., Executive Engineer, No. II Periyár division, to the Superintending Engineer, VI Circle, dated 12th June 1892, No. 1040.

I have the honour to forward the progress report for the division for the month of May and regret that the same has been delayed. This was owing to the preparation of the statement called for by the Chief Engineer in his remarks on the progress report for March last.

2. By the middle of July I hope we shall have completed the I reach and have closed the accounts for the next four and the actual expenditure for construction may then be entered for the first 20 miles.

3. Owing to the drainages of the country being complicated by the tanks, it is difficult to make a forecast. When it has been decided which tanks have to be abandoned and which retained, it will then be an easy matter to design the drainage works. I presume, however, that only the small ones will be abandoned, but they must be surveyed. This is especially the case with the V, VI and VIII branch channels which run through tanks. The lines of the others are on ridges except apparently the eleventh and twelfth.

ENCLOSURES.

PROGRESS report of works in No. II Periyár division for the month of May 1892.

I to V Reach, 0 *to* $20\frac{1}{3}$ *miles—(a)Masonry.*—Except the bridge in the IV reach just sanctioned but not yet commenced, the only works now on hand are—

1. Regulator at $7\frac{3}{8}$ mile ; nearly completed.
2. Additional sluice at 9th mile ; just commenced.
3. Do. at $10\frac{1}{3}$ do. do.
4. Culvert at 19th mile ; concrete for foundation laid throughout and masonry floor and part side walls well advanced.

(*b*) *Earthwork.*—Except the first reach the rest is completed ; on this the contractor had 500 men daily employed. His time ends on the 30th June. From the statement attached it will be seen that a heavy sum has yet to be expended on "earthwork," I reach, but, until the contractor's claims are settled, I cannot forecast the amount of saving on this item and have consequently entered the balance of the revised estimate as necessary for expenditure.

2. *VI Reach,* $20\frac{1}{3}$ *to* 24 *miles.*—(*a*) The cross drainage works are almost completed except No. 3 culvert which should be in July next.

(*b*) Two extra bridges have been sanctioned for this reach, but have not yet been commenced ; shall be in a few days.

3. *VII Reach,* 24 *to* $26\frac{3}{8}$ *miles.*—(*a*) The cross drainage works, viz. :—

	RS.
Culvert at 24 miles 6 furlongs	3,800
Superpassage, 25 miles 4 furlongs	10,300
Culvert at 26 miles 3 furlongs	6,450

Should be completed early in July and there will be no excess on the estimates.

(b) The bridge at 26⅓ miles is well advanced and may also be completed by the end of July, which will complete the reach. No extra works are necessary.

4. *VIII Reach*, 26⅝ *to* 27⅓ *miles—Masonry.*—One weir in Pappankulam tank completed; the second nearly so.

Regulator at 27 *miles* 3 *furlongs.*—Masonry commenced; a sluice will be required for Pappankulam tank in this reach and is not included in the estimate.

5. *IX and X Reachs*, 27⅓ *to* 30½ *miles.*—(a) The masonry for the two culverts at 27 miles 6 furlongs and 28 miles 2 furlongs, respectively, is being rapidly built as well as in the two culverts at 28 miles 7 furlongs and 29 miles 4 furlongs in the X reach.

(b) Earthwork in both reaches being sectioned.

(c) An extra bridge, which will cost Rs. 2,500, will be required in the X reach for the use of the villagers of Mangalam, a large village with a population of nearly 2,500. This work will be provided for in the revised appropriation statement. The plan is ready and will be submitted at once for sanction.

6. *The XI reach* (30½ *to* 36 *miles*) has been completely surveyed. There will be an excess in the earthwork now estimated at Rs. 30,650 of possibly 50 per cent., but the masonry of the cross drainage works can be reduced one-half and the weirs will be altogether eliminated. A saving of Rs. 40,000 may be anticipated.

(b) As in the XI reach the present trace of the XII (36 to 37 miles) runs almost on the watershed line and consequently the cost of the cross drainage works will be reduced. Since, however, the channel has to carry more water than originally intended, it will have to be made larger and the earthwork will be exceeded. This part, however, has not been completely surveyed, but some saving is sure to be made.

7. *Branch Channels* —(a) Work is going on to the third, fourth, fifth, sixth and ninth. The first two are practically completed and accounts should be closed in a month or two.

(b) The fifth, sixth, seventh and eighth run through a number of tanks which complicate the drainage of the country so much that I do not consider it advisable to push these on until the survey of this part is completed and it is decided what tanks are to be abandoned.

(c) Good progress has been made with the ninth branch channel in both earthwork and masonry.

8. The season is healthy and there were seasonable showers. The Chithra festival at Madura and Allagarkovil was held between the 7th to 15th and the works during this period were at an absolute stand, not more than 200 people being on them on those days. During the last fortnight, however, some 2,000 were daily employed. The monthly expenditure was consequently short, only a little over Rs. 17,000.

9. As directed, a forecast, showing the expenditure on each reach and each branch channel up to the end of March 1892, is appended. It will be seen that nearly Rs. 1,00,000 will be saved on the main channel. I am unable to state correctlfy what may be effected on the branch channels since the eleventh and twelth will be larger than they were originally as they are longer and have to irrigate more land.

(Signed) G. P. CARLESS,
Ex. Engr., No. II Periyár division.

12th June 1892.

STATEMENT showing the expenditure on each reach and each branch channel up to end of March 1892 and the further expenditure likely to be incurred to complete the works (*Vide* G.O., No. 454 I., dated 12th May 1892).

As per blue book.			As carried out.				
Sub-heads.	Names of works.	Estimate amounts.	Names of works.	Estimate amount.	Expenditure to end of March 1892.	Balance required to complete.	Total.
1	2	3	4	5	6	7	8
			I. Reach.				
		RS.		RS.	RS.	RS.	RS.
B. Land ..	Compensation ..	34,545	Compensation ..	34,545	18,049	951	19,000
D. Regulators ..	One head sluice, regulator and repairs to Peranai anicut ..	97,500	Two head sluices and one scouring sluice ..	53,180	49,383	..	49,383
E. Falls and weirs ..	One fall plan No. 45 ..	6,200	One fall ..	6,850	6,626	..	6,626
F. Cross drainage works.	Five culverts, 2 aqueducts and 2 surplus sluices.	90,400	Seven culverts and one surplus sluice ..	70,220	71,194	1,000	72,194
G. Bridges ..	Two bridges ..	15,700	Four bridges ..	26,768	25,041	959	26,000
L. Earthwork ..	Earthwork ..	1,40,655	L. Earthwork ..	1,64,560	1,15,006	49,554	1,64,560
....	......	.	Iron trough at 2½ miles ..	..	1,000	..	1,000
....	......	..	O. Four irrigation sluices ..	2,270	2,485	..	2,485
	Total ..	3,85,000	Total ..	..	..	..	3,41,248
			II. Reach.				
B. Land ..	Compensation ..	5,710	Compensation ..	5,710	6,098	200	6,298
D. Regulators ..	......	..	One regulator and one irrigation sluice ..	12,190	5,131	7,059	12,190
F. Cross drainage ..	Four cross drainage works ..	41,290	Four cross drainage works ..	39,080	46,120	..	46,120
G. Bridges ..	One bridge with road diversion, &c. ..	12,320	......	..	..	..	..
L. Earthwork ..	Earthwork ..	34,680	Earthwork ..	49,200	5,341	459	54,000
	Total ..	94,000	Total ..	..	..	..	1,18,608
			III. Reach.				
B. Land ..	Compensation ..	16,745	Compensation ..	16,745	18,009	..	18,009
D. Regulators ..	Three irrigation sluices ..	5,310	Four irrigation sluices ..	5,100	3,710	1,390	5,100
E. Falls and weirs ..	......	..	One drop ..	2,180	2,076	..	2,076
F. Cross drainage ..	Seven cross drainage works ..	97,780	Seven cross drainage works ..	1,02,560	1,09,406	1,194	1,11,600
G. Bridges ..	Three bridges ..	10,500	Four bridges ..	16,403	16,536	..	16,536
L. Earthwork ..	Earthwork ..	71,665	Earthwork ..	1,00,150	93,666	6,484	1,00,150
	Total ..	2,02,000	Total ..	..	..	..	2,53,471
			IV. Reach.				
B. Land ..	Compensation ..	8,455	Compensation ..	8,455	5,119	..	5,119
D. Regulators ..	One irrigation sluice ..	1,770	One irrigation sluice ..	1,150	1,345	..	1,345
E. Falls and weirs ..	......	..	One weir ..	520	592	..	592

Statement showing the expenditure on each reach and each branch channel up to end of March 1892, &c.—*cont.*

As per blue book.			As carried out.				
Sub-heads.	Names of works.	Estimate amounts.	Names of works.	Estimate amount.	Expenditure to end of March 1892.	Balance required to complete.	Total.
1	2	3	4	5	6	7	8
			IV Reach—cont.				
		RS.		RS.	RS.	RS.	RS.
F. Cross drainage ..	One culvert	12,380	One culvert	6,900	6,767	..	6,767
....	......	..	One iron trough	1,000	..	1,000	1,000
G. Bridges	......	..	One bridge with iron trough	3,100	..	3,100	3,100
L. Earthwork	Earthwork	8,398	Earthwork	25,000	24,992	..	24,992
O. Miscellaneous ..	......	..	Miscellaneous	160	158	..	158
	Total ..	31,000	Total ..	..	..	..	43,073
			V Reach.				
B. Land	Compensation	10,975	Compensation	10,557	9,248	252	9,500
F. Cross drainages ..	Two cross drainage works	93,340	Four cross drainage works	48,180	42,715	8,285	51,000
G. Bridges	Two bridges	7,650	Two bridges	7,100	7,360	..	7,360
L. Earthwork	Earthwork	29,035	Earthwork	29,035	26,388	2,647	29,035
....	......	..	Two iron troughs	..	..	2,000	2,000
	Total ..	1,41,000	Total ..	..	..	..	98,895
			VI Reach.				
B. Land	Compensation	12,205	Compensation	12,205	3,319	1,181	4,500
F. Cross drainages	Three cross drainage works	32,960	Three culverts, one super-passage and one outlet weir	26,370	11,951	14,419	26,370
G. Bridges	One bridge	3,460	Three bridges	7,950	1,958	5,992	7,950
L. Earthwork	Earthwork	35,375	Earthwork	35,375	29,734	11,641	41,375
....	......	..	Two iron troughs	..	..	2,000	2,000
	Total ..	84,000	Total ..	..	..	..	82,195
			VII Reach.				
B. Land	Compensation	5,315	Compensation	5,315	2,128	1,000	3,128
F. Cross drainage ..	Three cross drainages	37,140	Four cross drainage	20,880	8,592	12,288	20,880
G. Bridges	One bridge	2,140	Two bridges	6,990	3,620	3,370	6,990
L. Earthwork	Earthwork	22,405	Earthwork	22,405	16,693	5,712	22,405
	Total ..	67,000	Total ..	..	..	..	53,403

			VIII Reach.				
B. Land ..	Compensation	7,475	Compensation	7,475	853	1,000	1,853
F. Cross drainage	One cross drainage	12,380	Two outlet weirs	2,965	694	2,271	2,965
G. Bridges ..	One bridge	3,670	One bridge and regulator	7,500	..	8,000	8,000
L. Earthwork ..	Earthwork	9,475	Earthwork	9,415	7,419	2,056	9,475
O. Miscellaneous	......	..	Irrigation sluice	..	..	1,200	1,200
	Total ..	33,000	Total ..	..	..	..	23,493
			IX Reach.				
B. Land ..	Compensation	810	Compensation	810	716	94	810
D. Regulators ..	One irrigation sluice	1,770	One irrigation sluice	1,150	..	1,150	1,150
F. Cross drainage	Two cross drainage works	24,760	Two culverts	12,900	2,853	10,047	12,900
L. Earthwork ..	Earthwork	5,660	Earthwork	10,000	7,240	2,760	10,000
	Total ..	33,000	Total ..	..	..	..	24,860
			X Reach.				
B. Land ..	Compensation	810	Compensation	810	361	449	810
D. Regulators ..	One irrigation sluice	1,770	One irrigation sluice	1,150	..	1,150	1,150
F. Cross drainage	Two cross drainages	24,760	Two culverts	10,700	876	9,824	10,700
G. Bridges ..	......	..	One bridge	2,500	..	2,500	2,500
L. Earthwork ..	Earthwork	3,660	Earthwork	3,660	2,850	810	3,660
	Total ..	31,000	Total ..	..	..	..	18,820
			XI Reach.				
B. Land ..	Compensation	7,890	Compensation	7,890	308	7,582	7,890
D. Regulators ..	One irrigation sluice	1,770	Four irrigation sluices	4,440	..	4,410	4,440
E. Falls and weirs	Six falls	15,990	....	..	..	..	..
F. Cross drainage	Cross drainages	91,320	Cross drainages	50,000	..	50,000	50,000
G. Bridges ..	One bridge	2,380	Three bridges	6,000	..	6,000	6,000
L. Earthwork ..	Earthwork	30,650	Earthwork	45,000	..	45,000	45,000
	Total ..	1,50,000	Total ..	..	..	..	1,13,330
			XII Reach.				
B. Land ..	Compensation	3,600	Compensation	3,600	..	..	..
D. Regulators ..	......	..	....	..	..	..	..
E. Falls and weirs	......	..	....	..	..	..	..
F. Cross drainages	Two cross drainages	24,760	} Not known	..	..	..	..
G. Bridges ..	One bridge	2,380					
L. Earthwork ..	Earthwork	4,260	Earthwork	4,260	..	..	..
			(3) DISTRIBUTARIES.				
			I Branch Channel.				
B. Land ..	Compensation	16,250	Compensation	16,250	9,137	..	9,137
D. Regulators ..	One head sluice	1,770	One head sluice	1,150	936	..	936
E. Falls and weirs	Eight falls	5,820	Seven falls	8,008	5,808	..	5,808

Statement showing the expenditure on each reach and each branch channel up to end of March 1892, &c.—*cont.*

As per blue book.			As carried out.				
Sub-heads.	Names of works.	Estimate amounts.	Names of works.	Estimate amount.	Expenditure to end of March 1892.	Balance required to complete.	Total.
1	2	3	4	5	6	7	8
		RS.	*I Branch Channel*—cont.	RS.	RS.	RS.	RS.
F. Cross drainage ..	Two culverts	5,480	Three culverts	5,480	..	5,480	5,480
L. Earthwork	Earthwork	13,530	Earthwork	13,530	6,037	..	6,037
O. Miscellaneous ..	Irrigation sluices	3,150	......	..	..	..	..
	Total ..	46,000	Total ..	..	..	..	27,398
			II Branch Channel.				
B. Land	Compensation	810	Compensation	810	306	..	306
D. Regulators .. .	One head sluice	1,770	One head sluice	1,150	1,114	..	1,114
E. Falls and weirs ..	Three falls	1,950	Two falls	2,288	2,005	..	2,005
F. Cross drainage works.	One culvert	2,740	One culvert	730	752	..	752
G. Bridges	Road tunnel	960	Road tunnel	400	415	..	415
L. Earthwork	Earthwork	5,500	Earthwork	5,500	4,435	..	4,435
O. Miscellaneous ..	Irrigation sluices	1,270	......	..	..	..	..
	Total ..	15,000	Total ..	..	..	..	9,027
			III Branch Channel.				
B. Land	Compensation	3,150	Compensation	3,150	2,619	..	2,619
D. Regulators	Two head sluices and one regulator	4,020	Two head sluices and one regulator	2,780	3,867	..	3,867
E. Falls and weirs ..	Twelve falls	8,700	Twelve falls	9,180	5,945	3,000	8,945
F. Cross drainages ..	One culvert	2,740	One superpassage	1,130	92	1,038	1,130
G. Bridges	......	..	One road tunnel	570	616	..	616
L. Earthwork	Earthwork	9,240	Earthwork	9,240	8,017	350	8,367
O. Miscellaneous ..	Irrigation sluices	4,150	Combined with falls	..	..	..	..
	Total ..	32,000	Total ..	..	..	..	25,544
			IV Branch Channel.				
B. Land	Compensation	8,100	Compensation	8,100	4,370	1,000	5,370
D. Regulators	Two head sluices and five regulators	6,670	Two head sluices and five regulators	5,650	3,155	2,495	5,650
E. Falls and weirs ..	Twenty-one falls	18,730	Twenty-one falls	17,660	9,062	8,598	17,660
G. Bridges	Three road tunnels	2,370	Three road tunnels	2,370	2,562	500	3,062
L. Earthwork	Earthwork	37,750	Earthwork	37,750	23,145	10,000	33,145
O. Miscellaneous ..	Irrigation sluices	8,380	Combined with falls	..	..	..	..
	Total ..	82,000	Total ..	..	..	..	64,887

MADURA,
12th June 1892.

(Signed) G. P. CARLESS,
Executive Engineer, No. II Periyár Division.

20th June 1892.

(Signed) A. C. SMITH, Lieut.-Col., R.E.,
Superintending Engineer, VI Circle.

No. 132 P.R.

Submitted, together with the progress report and statement, to the Chief Engineer, Public Works Department, with reference to para. 3 of his note recorded in G.O., No. 454 I., dated 12th May 1892.

20th June 1892. (Signed) A. C. SMITH, Lt.-Col., R.E.,
Superintending Engineer, VI Circle.

Note by the Chief Engineer, Public Works Department.

Submitted for the information of Government.

2. The report is accompanied by the forecast called for in G.O., No. 454 I. of 12th May 1892, showing as far as is at present possible the probable total expenditure on each reach of the main channel and on each branch channel.

3. The statement shows a probable saving of Rs. 79,602 on the first eleven reaches of the main channel, which will probably be increased to about Rs. 90,000 by the inclusion of the twelfth reach, in which there will certainly be a considerable saving.

4. Taking the channel as a whole there is a considerable excess on earthwork, caused partly by increased rates, partly by a larger proportion of rock and hard soil, and partly by alterations in alignment which have been found necessary for various reasons; on the other hand there has been a considerable saving in the cost of masonry works, and this, with the exception of the first reach, where nearly Rs. 50,000 has been saved by alterations in the design of the head sluice and regulator, is mainly due to alterations in the designs of the cross drainage works, culverts or superpassages having been in every case substituted for the inlets and outlets provided in the original designs.

5. This alteration, while adding very largely to the efficiency and safety of the works, involved a slight excess in the upper reaches, where the channel being broad, the superpassages cost more than the inlets and outlets, the cost of which is independent of the width of the channel. In the lower reaches, however, the saving is very considerable.

6. The original estimates provided somewhat insufficient means of crossing the channel and this defect has now been remedied, nine additional bridges having been provided, while the majority of the superpassages have been designed so as to be used as crossings except in high floods.

7. The numerous falls provided in the eleventh reach have been entirely got rid of by an alteration in the alignment at the expense of an increase in the cost of excavation nearly equal to that of the falls.

8. The forecast for the first four branch channels shows a saving of about Rs. 48,000, and, though it is not likely that this proportion will be maintained in the lower branches, there will probably be some saving in them.

9. It is probable that the total saving on the distribution works will not be less than Rs. 1,50,000.

MADRAS, (Signed) J. PENNYCUICK, Colonel, R.E.,
22nd June 1892. Chief Engineer, P.W.D.

ORDER—dated 27th June 1892, No. 564 I., Public Works.

Recorded and forwarded for the information of the Government of India.

(Here enter No. 565 I., Public Works, dated 27th June 1892.)

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Chief Engineer for Irrigation.
" Superintending Engineer, VI Circle.
" Revenue Department.

ENDORSEMENT—dated 27th June 1892, No. 565 I., Public Works.

Copy of the above forwarded to the Government of India.

(By Order.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

IRRIGATION.

Govt. of {1892} Madras.

PUBLIC WORKS.

Dated June, 27th.

Recd. *Encl.*

G.O., 27th June 1892, Nos. 564, 565 I.

JUNE.

Periyar Project

Forwarding copy of Proceedings recording the — of works in No. II Periyár division for the month of May together with a note thereon by the Chief Engineer, Public Works Department.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

From Lieut.-Colonel A. C. SMITH, R.E., Superintending Engineer, VI Circle, to the Chief Engineer, Public Works Department, dated Trichinopoly, 17th June 1892, No. 128 P.R.

I have the honour to forward, for the sanction of Government, the completion report of No. 1 aqueduct or second cross drainage work in the second reach of the main channel in No. II Periyár division, Periyár project.

2. The estimate for the work, amounting to Rs. 11,900, was sanctioned in G.O., No. 440 I., dated 12th September 1889, and the work was completed in March 1892 at an outlay of Rs. 17,485-7-7.

3. The excess of Rs. 5,584 or 46·93 per cent. over the estimate has been due to the following causes :—

	Excess. RS.
(*a*) Substitution of coursed rubble, first sort, set in mortar of concrete in foundations	600
(*b*) Substitution of concrete in arch work for burnt stone in mortar.	547
(*c*) Increased rate given for cutstone work	743
(*d*) Excess quantity of work done and increased rates given for excavating foundations	2,719
(*e*) Heavy springs met with in baling	3,694
(*f*) Inadequate provision in the estimate for centring	50
(*g*) Want of provision in the estimate for diversion of odai	303
(*h*) Increased rate given but less work done in plastering with chunam	8
Total ...	8,664
Deduct savings in the items of concrete broken stone in chunam, pointing with chunam, roughly dressed ashlar, increasing the thickness of concrete arch at crown and contingencies	3,080
Net excess ...	5,584

4. The completion report has been duly verified by the Examiner of Public Works Accounts and the excess outlay requires the sanction of Government.

Order—dated 30th June 1892, No. 574 I., Public Works.

The Examiner of Public Works Accounts is authorized to pass the expenditure incurred on the work "No. 1 aqueduct or second cross drainage work, second reach

Periyár main channel," the excess outlay of Rs. 5,585 being met from the balance of the amount reserved for unforeseen works of the Periyár project, which will then be reduced to Rs. 1,84,606.

2. This sanction is registered as No. 63 I. of 1892–93.

3. The large excess on the estimate is very unsatisfactory.

(True Extract.)

(Signed) J. PENNYCUICK, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintending Engineer, VI Circle, with one enclosure.
,, Chief Engineer for Irrigation.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Govt. of {1892} Madras.

PUBLIC WORKS

Dated June, 30th.

Recd. *Encl.*

G.O., 30th June 1892, No. 574 I.

JUNE.

Periyar Project

No. 1 *Aqueduct.*—The Examiner of Public Works Accounts authorized to pass the excess expenditure of Rs. 5,585 incurred on — or second cross drainage work, second reach, Periyár main channel.